Virginia WILDLIFE

OCTOBER, 1952

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Photo by Aycock Brown

FISH OF THE YEAR

Pictured above is the amazing 367½ pound blue marlin, recently captured by Mrs. Ross H. Walker, of Richmond. Fish was caught in Gulf stream off Hatteras after a four hour battle (see story pages 8-9-10). Members of party include (left to right) Mrs. Ross Walker, Ross Walker, Capt. Ernal Foster, skipper of "*Albatross II*," and Capt. Milton Meekins, his mate

Virginia WILDLIFE

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A Monthly Magazine Dedicated to the Conservation, Restoration, and Wise Use of Virginia's Wildlife and Related Natural Resources, and to the Betterment of Hunting and Fishing in Virginia

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In This Issue

Cover

October sunsets in themselves are generally superior to sunrises; but, as the great Hillard said, with the sunset we appreciate images drawn from departed peace and faded glory.

Photo by Harold M. Lambert

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GOD IS MY LANDLORD

GOD is my Landlord! Does this sound strange? Is not this world mine? Haven't I bought my property, or isn't the lake or stream a public domain?

Whence came these forests and streams, the fertile land and the rich deposits? They are our heritage. Past generations have used them and passed them on to us. They have given us a trust, telling us to pass them on again to our children and our children's children. We have been told that we owe it to future generations to preserve what we have that generations to come may not suffer for our negligence or misuse.

How did our ancestors come into such rich possessions? They too received them, for God created all things good, and passed them to men, telling them to use these things of our world.

Yet, you know what has happened. In many areas the good earth has been despoiled. The forests were cut without sense, and men misused this rich heritage. They thought they could get some gain for themselves. They didn't worry about the generations to come for they thought there would be enough for all time, or else they didn't care.

We forgot that it really belonged to God. We coveted, we stole, we destroyed that which belonged to God. The Landlord's final rent may not be due, but already we are paying and paying. Having sown the wind we are beginning to reap the whirlwind, and no one yet knows what the future will bring unless we bring ourselves to restore and properly use this heritage.

One wonders the price which God will exact from mankind for so much use of these resources for evil, for war and destruction. But just as surely as this is wrong, so it is wrong to think that we can be lazy, indifferent, or hostile to our world. It is good, and God wants it maintained and improved for good. It is ours to share, not to use selfishly for ourselves alone.

It is a source of wonder that the church has not been more active on the side of conservation. From that which has been said it should be evident that the church has something to say about the way that we use this world, for we are only stewards of what belongs to God.

The church *has* been active in conservation, that of the human soul, and that of life. Its attention has been focused, perhaps too exclusively, on that which will exist forever. We work to conserve men's souls that they may enter the heritage of heaven which is God's will. So also the church has been concerned about the sacredness of human life. But our message should cover the *whole* of man, even his environment.

The church is not the agency which, in its major program, can teach the methods of soil conservation, of wildlife conservation, etc. It has many other things of extreme importance to teach. One thing, however, it can and must do. It must teach man a responsibility as over against the heritage which he has received from God. Man must learn that God is his Landlord.

In your work you try to educate, and you are influential in the establishment of laws which fit our best understanding of conserving our heritage. One thing further is needed. Men must want to obey these laws and follow these suggestions. Perhaps it is in this field that we of the church can be of service. If we love God we will want to do His will. If we know that this world is really His, we will want to use it wisely and well. We need to learn to live with our Landlord.

We are proud of our land, our nation and its resources. Let us make use of our opportunity, let us maintain that we have received, let us pass it on improved to our children, for God is our Landlord.—The Reverend Orvis M. Hanson. *Condensed from the Wisconsin Conservation Bulletin.*

FLYWAY MANAGEMENT*

By ALBERT M. DAY

Director, Fish and Wildlife Service

Photos courtesy U. S. F. W. S.

THERE have been very significant changes in concept on waterfowl management within the past few years—changes that can lead only to improved management of the resource. It was not long ago that state administrators throughout the country held pretty much to the idea that responsibility for managing waterfowl rested solely with the federal government; few were willing to spend state funds or energies on ducks and geese, concentrating instead on those species the responsibility for which rested with the states. Now waterfowl management is an important part of the program of every state department.

The federal and state programs have been coordinated and correlated quite well, but improvements can still be made, and I am hopeful that federal-state relations will continue to improve until we are complementing each other completely. Actually, there are so few of us charged with responsibility for protecting, managing, and perpetuating the wildlife resource that there is little excuse for us to be going in separate directions, wasting our energies fighting and bickering amongst ourselves while there are so many forces that affect adversely the practices and principles for which we stand.

In forecasting the effect of industrial and agricultural expansion on the various species of wildlife, waterfowl probably head the list of those that are in jeopardy. For many others, the situation is quite bright. The chief problem in big game management, for instance, is to hold the numbers down—to find adequate wintering range to overcome the periodic die-offs that occur in many states. Overpopulations often lead to the creation of firing lines such as we have seen in the Montana and Wyoming elk herds—distasteful to the American public, yet starvation is the only alternative.

For waterfowl, the long-range view is not at all optimistic. With good management, we can continue to have duck and goose shooting for many years to come, but agricultural needs are more competitive with the kind of environment that produces waterfowl than with that required by any other form of wildlife. Increased agricultural pressures, spurred by Government benefits, will undoubtedly continue to sap life-giving waters from the natural marshes in the agricultural and the coastal states. The increased demands made each year by American consumers of agricultural products and the incidental commitments of this government for the

*Address by Albert M. Day at Western Association of State Game and Fish Commissioners' conference, Glacier National Park, June 17, 1952. Condensed with Mr. Day's permission.

shipment of supplies to needy peoples elsewhere in the world result in the constant destruction of waterfowl habitat. Representatives of certain government agencies continually remind the public of the need to expand agriculture by turning into crop and pasture uses lands which they now consider unproductive, but which in fact are the backbone of production for any species of waterfowl. A recent report issued by the Department of Agriculture states that since 1943 13.3 per cent of the potholes of South Dakota have been drained. True, the construction of farm ponds and of water impoundments for irrigation, flood control, and navigation will provide some offset, but I am convinced that these will never replace the drained natural marshes.

The shrinkage of habitat on the breeding grounds is matched by its disappearance in the all-important wintering areas. High prices for cotton and rice are now converting even this small remnant of natural habitat into irrigated fields, while the state and federal governments combined are unable to prevent the wintering ground destruction that we see before our very eyes.

I mention this present trend not in the spirit of criticism but to point out the fact that we in the wildlife field must face the cold, hard fact that as agriculture expands the productive areas for waterfowl are bound to disappear. Conservation interests must never relax if waterfowl habitat is to be saved. Unless we are successful, I predict that it will not be too many years before the annual arguments about opening days, length of seasons, bag limits, and other details of regulation will be of little or no importance. There will be nothing to regulate.

I am glad to see the Flyway Councils looking at this grim picture realistically and banding together to assist in the preservation of existing habitat and in the development of new areas.

Such problems should be the chief concern of the Councils. The Atlantic Flyway group, after several conferences, has developed a so-called blueprint of Waterfowl Management Objectives. Copies have been sent to all of the states. This is an endeavor to coordinate the state and federal acquisition and development programs; also to encourage private individuals to do as much as they can toward preserving and improving essential habitat. I am hoping that all of the Flyway groups will follow something similar to this pattern and that within a year or so we may have a National waterfowl blueprint which will give better guidance in meeting the critical problems of the years ahead.

The recent large increase in allotments of Pittman-Robertson funds to the states has been most helpful and has had a large part in the changing attitude of the states toward waterfowl management. You will recall that in the early days of Pittman-Robertson the Congress appropriated specific amounts, the highest of which in the fiscal year 1942 reached $2,750,000. Since that time, and largely due to the efforts of the International

Air-thrust boats are ideal for survey work over the shallow waters of the northern waterfowl breeding grounds

Association, Congress changed that policy and adopted language which now appropriates the entire income from the Arms and Ammunition Tax each year. Last year the figure was close to $18,000,000. The states have spent roughly $15,000,000 for the acquisition, development, and maintenance of waterfowl projects since Federal Aid was initiated 14 years ago.

Not only are the states acquiring and developing areas, but they are also carrying on many useful studies designed to supply information needed for the making of the annual regulations. During fiscal year 1952, the states spent $421,000 for waterfowl studies to obtain information useful in establishing regulations, $158,000 for research in techniques of habitat development, and $160,000 for dove and pigeon studies useful in establishing regulations. This makes a grand total of around $750,000 of Pittman-Robertson expenditures to gather information useful in the determination of what the annual hunting regulations should be. The states have in general cooperated wholeheartedly in law enforcement, employing trained wardens far in excess of the number of federal agents in the field.

While speaking of expenditures, I should also tell you that the Fish and Wildlife Service last year obligated more than $6,750,000 for waterfowl—funds derived from general appropriations, from Duck Stamp sales, from reverted Pittman-Robertson monies, and from Federal Refuge receipts. This money was used for enforcement, acquisition, development of refuges and management areas, and for research.

Approximately $8,500,000 of public funds are now being spent annually by the states and the U. S. Fish and Wildlife Service in the combined waterfowl programs. If there is any better proof of the need for close coordination to insure that every dollar spent will result in the highest possible return, I would like to have it.

The service recently realigned its organization to serve better the needs of flyway management and to achieve the kind of coordination that seems essential.

A U. S. Fish and Wildlife Service plane taking inventory of wintering ducks off Texas and Mexican coast

For years the Research Branch of the Service has been developing methods of collecting and analyzing data concerning migratory birds. The approach has become quite standardized in so far as the assessment of winter and summer population trends is concerned. We feel that that kind of research has now emerged into the field of practical management.

Last January the decision was made to combine the standardized observational functions of the Service with the activities of the Branch of Game Management, the unit that has long been responsible for enforcing the regulations and for handling depredation problems. It is entirely logical that combining these two activities should result in closer coordination between fact-finding and the enforcement of the regulations based upon those facts.

The enlarged Branch of Game Management, at both the Washington and the regional levels, has one section giving primary attention to law enforcement, and another primarily to management. By management we mean the collecting, correlating, and assessing the wealth of information coming from all sources in each region. The regional management personnel are to be responsible for keeping informed of the results of Federal aid projects, of the observations of the refuge managers, game management agents, cooperative unit leaders, and all other sources supplying pertinent data. They will regionally supervise winter inventories, hunter bag checks, and the collection of kill data, which when combined with that collected by the Flyway biologists working on the Canadian and Alaskan breeding grounds will be assessed on a Flyway basis to be available at the time the annual regulations are under consideration.

I should like at this point to comment that relations between the Fish and Wildlife Service and Ducks Unlimited have been most amicable for some time, and I am hoping that this will continue. D. U. biologists are now working with the Canadian and United States crews in Canada. Methods of assessing population trends have been agreed upon between all interested parties, and I feel confident that so long as we can continue with our present approach there will be little need for the differences in predictions and expressions of abundance or scarcity which led to some of the past difficulties. I am most happy over the present situation with Ducks Unlimited.

I should like to repeat what I stated at the beginning—that the management of the waterfowl resource is a challenge to all of us and that we must work together as a team with as little bickering and quarrelling as is humanly possible. It must be remembered that the primary responsibility for waterfowl regulations rests with the federal government under treaties with Canada and Mexico. We propose to carry that responsibility, but we see no reason why the states should not participate, not only in the matter of the development of habitat but also in gathering information and assisting in the assessment of the data so that better regulations may result. I am hopeful, however, that these Flyway Councils and Flyway organizations that have come into being within the last year or so will not spend all of their energies and efforts on the mere matter of regulations. Regulations are temporary. They adjust the take to the supply year by year and should be considered on that basis alone. Seasons and bag limits may be liberal in times of plenty and restrictive in times of scarcity. So, while they do have the greatest appeal to the individual duck hunter, from our point of view they are merely one of the tools of management. The important thing that we must never forget is that this sport of wildfowling is dependent upon the continuing availability of suitable nesting grounds, of resting and feeding areas along the migration routes, and of adequate wintering facilities. If we let these essentials slip from our grasp, all of the committees and all of the councils and advisory groups that we can put together will not make much difference. Conferences do not produce ducks—only Mother Nature, with our help, can do that job.

"My Blue Heaven"

By MRS. ROSS H. WALKER

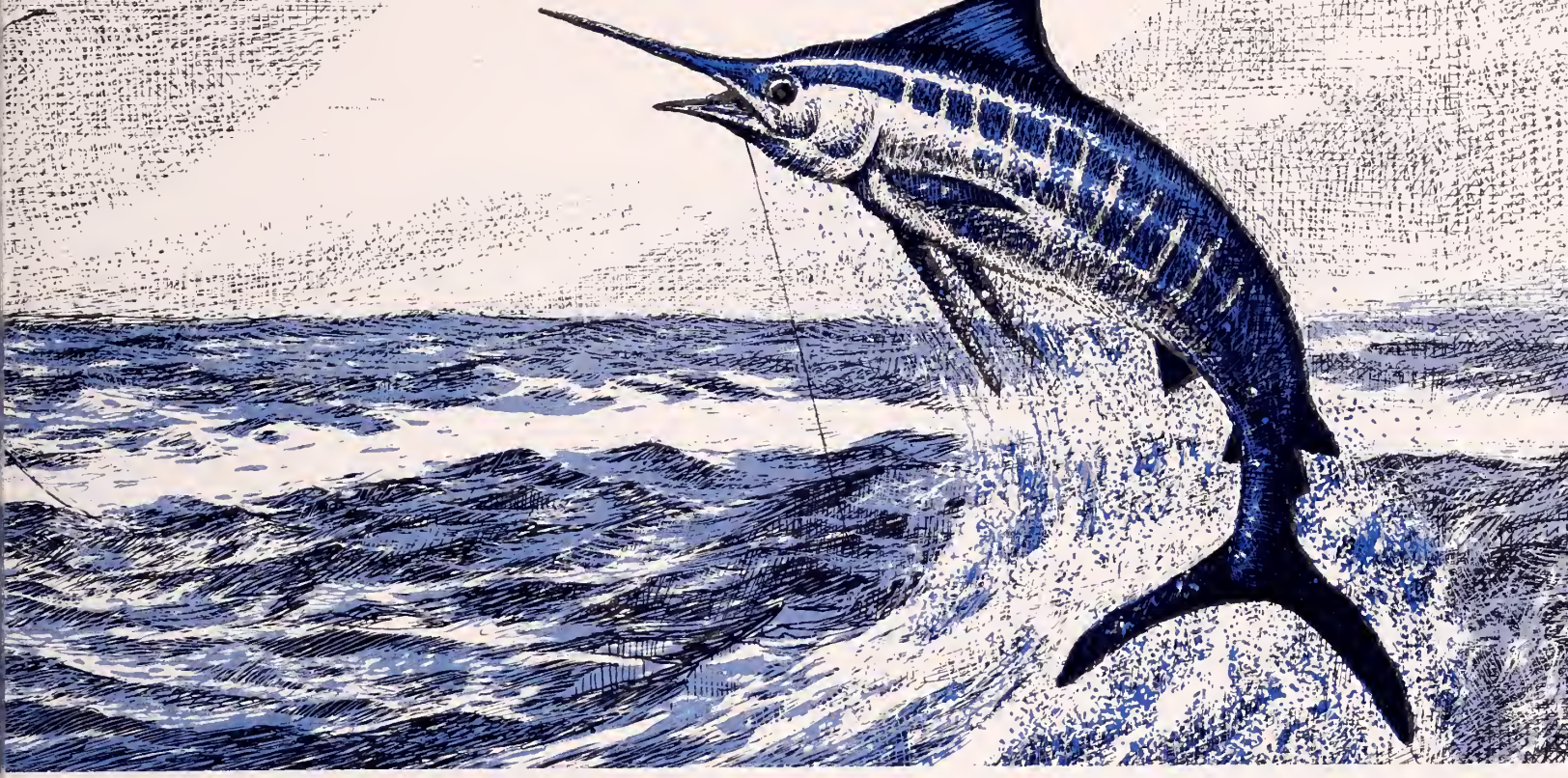
I MARRIED a fisherman knowingly. He didn't try to keep it from me. Most of our courting was done with rod and reel on the Chickahominy River and in fresh water ponds around Richmond. Not only have I enjoyed fishing *per se*, but it has been the means of many happy and healthful hours spent together when otherwise we might have gone our separate ways for our leisure time.

Two edicts were laid down when I showed interest in learning to fish. One was that I must learn to handle the boat before I learned to fish. The other was that if a rod were dropped overboard through carelessness, I had to go overboard for it. I learned to handle the boat, and I also retrieved a rod from the Chickahominy. Now, if ever a rod goes over, I guess I will end up down there with it. I only hope it will be in a pond and not out at sea.

After quite a bit of fresh water fishing I was naturally eager to try salt water fishing. Then my ambition was dual—to catch fish until I was tired physically, and to catch one weighing over 25 pounds. Both of these wishes were gratified on my first trip to Chincoteague with Ross. We were fishing there and were lucky enough to get into a school of sea trout and, literally, we caught all the fish either of us could handle. On the way back in, we put out some heavy tackle and I landed my shark weighing about 35 pounds.

[Editor's Note: Several months ago Virginia sportsmen learned of the remarkable prowess of a lady angler, Mrs. Ross H. Walker of Richmond. Her 367½ pound blue marlin measured 10 feet, 10 inches from tip to tip, and is reported to be one of the record fishes caught north of the British West Indies by a woman. Mrs. Walker and her husband, Ross H. Walker, prominent Richmond business executive and member of the State Water Control Board, were trolling off Hatteras, N. C. aboard the cruiser "Albatross II."

We are deeply indebted to Mrs. Walker for this personalized account of her epic battle.]



"The big fish surfaced only once after being hooked, and then after about three hours he made one grand leap clear of the water about 50 yards off the stern"

Fortunately neither of us gets seasick, but I am quite frank to say that I have been ill mentally several times when fishing for channel bass from a boat in the surf at Oregon Inlet.

Last year I made my first trip to Hatteras, North Carolina. And glad I am that I was privileged to see this wonderful Outer Banks country before our more modern ways encroach upon that unique and picturesque section. Even with the passing of just this one year since the road has been finished, many changes have been made. It is the law of progress that changes will continue.

We were able to be there for only two days of sea fishing in 1951, but they were both days to remember. We caught dolphin, amberjack, false albacore, Arctic bonita, and king mackerel—the dolphin and amberjack weighing up to about 25 to 30 pounds and the king mackerel running to about 15.

Never had I been after big game fish before, but we had seen one white marlin swim by our boat while fishing at Chincoteague. Just prior to this Hatteras trip, Captain Ernal Foster, with whom we fish at Hatteras, had caught a blue marlin weighing 475 pounds. Then and there, upon hearing of this, we promised ourselves to take our week this year and try only for the "Big Boys."

So, in the spirit of the Forty Niners, we left Hatteras with Captain Foster this year on the *Albatross II* on Sunday, July 13, and headed for the Gulf Stream. On the way out we had to put our lines overboard to wet them and rewind them tightly on our reels. We wanted to be ready when and if a big one came along. A few miles south of the Diamond Light Ship we put out our two mackerel baits from the outriggers and waited. It was then about 11:30. Shortly a blue marlin came up, surfaced, looked at our baits and departed. I was using a 72 pound test line, a 9/0 reel, and a 12 ounce tip rod. My leader was a nylon single filament, 125 pound test. I had the port chair and Ross fished with somewhat heavier tackle from the starboard chair.

At about 1:15 another blue marlin surfaced and came over and took my bait and pulled the line free of the outrigger. As it turned out later, he was hooked deep in the throat. He took out about 400 yards of line before he could be stopped, with the boat following him all the time. The light rod tip and the light line did not permit very much brake on the reel. Much helpful advice and encouragement from Captain Foster and Ross helped to calm my real panic, and I then settled down to what was to prove a long grind indeed. After fighting the fish, losing line and recovering for about three hours, with all the drag the tackle could stand, it became pretty apparent that the fish could not be landed on that rig. The nylon line had become so tightly wound around the reel that it caused the flanges on the spool to freeze against the frame.

Captain Foster then conceived of the brilliant idea of cutting my line and attaching it to a larger 10/0 reel which was not full of linen line. He did this, while the marlin had out about 200 yards of my nylon line, by having the mate follow the fish with the boat. He then gathered in some line by hand and made the connection to the new linen line. Thereafter I had a 10/0 reel and a 15 ounce tip rod.

Just after this tense moment we had another bad time

when a tanker, the *Tydol Bayonne*, going south in the shipping lane, bore down upon us at cruising speed. The fish was pulling us toward the oncoming ship and it looked for a time like we were going to have to cut the line to avoid colliding with the tanker. They finally passed us not more than 200 yards off, with many of the crew on deck cheering our efforts. We still had the fish on because at that time it had been fighting deep and the line did not become fouled.

Since the fish was hooked very deep, he did not jump as much as blue marlin are supposed to do. He surfaced only once after being hooked, and then after about three hours he made one grand leap clear of the water about 50 yards off the stern.

We did not see the fish again until nearly four hours after it was hooked, when the leader appeared for the first time. The fish took out more line in several more short runs, but finally was brought to the stern of the boat and our mate, Milton Meekins, succeeded in gaffing him. One fishing chair was then removed from the stern and with much difficulty, the Captain, Mate Meekins, and Ross hauled him aboard, just about 4 hours and 20 minutes after it was hooked. He was fighting in the stern of the boat and the Captain had to hit him several times with the persuader. Upon examination it was interesting to note that a pilot fish about 15 inches long was still attached to him on the belly. After having followed the fish in various directions all afternoon, we ended up about 10 miles southeast of the Diamond Light Ship. It was interesting to note from the Coast & Geodetic chart that the water was about 200 feet where the fish was hooked and about 900 feet deep where the fish was boated.

I believe about the entire population of Hatteras was on hand to greet us late that night when we reached dock. The fish was duly weighed and measured—367½ pounds, 10′10″ in length, 52″ in girth and had a tail spread of 4 feet. I fully realize how fortunate I was to have caught my blue marlin the very first day I had ever tried to fish for one, and I think you will agree with me that Hatteras on July 13, 1952, was indeed "My Blue Heaven." I believe if you were to ask Ross, he would say—"Men, teach your wives to fish."

DATES TENTATIVELY SET FOR BIG GAME CONTEST

The date for the state's annual Big Game Trophy Contest has been set tentatively for November 1, 1952.

The contest east of the Blue Ridge is again being sponsored by the Virginia Peninsula Sportsmen's Association, located at Newport News. George Johnson, 60 Hopkins Street, Hilton Village, Virginia, is chairman of this contest for the association.

The contest for west of the Blue Ridge is being sponsored by the Harrisonburg Chapter of the Izaak Walton League of America. The chairman of the trophy committee is Peter J. Hanlon, U. S. Forest Service, Harrisonburg.

To be eligible for entry in the state contest, which will be held in Richmond, all trophies must have been entered first in the regional contest and must have been one of the top five winners in their respective regions. Deer and bear must be entered in their respective area contest; for example, if the animal is killed east of the Blue Ridge it must be entered in the contest for that area.

Of local interest are the classes open to smaller deer trophies, such as six and eight pointers. Local prizes will be awarded to winners in each of these classes, but only winners in the major events will be eligible for entry in the state contest.

Successful bear hunters of last year are especially urged to enter their trophies in the local contests. It will not be necessary for trophies to be mounted.

Dates for the regional contests are tentatively set as follows: Harrisonburg, October 25, 1952; Newport News, October 25, 1952.

Any deer or bear legally killed in 1951-52 is eligible for entry in this year's Big Game Trophy Contest.

For those who wish to enter their trophies, either bear or deer, in the Big Game Trophy Contest, it will not be necessary to have them mounted.

Only the antlers and a small portion of the skull which holds them in place are required to enter a deer trophy; the skull is all that is required for entering a bear trophy.

Chinese Chestnuts

for wildlife and farm wood lots

By JESSE D. DILLER
*pathologist**

Photos courtesy U. S. D. A.

This is the first in a series of two stories on Chinese chestnuts. The second will be written by John W. McKay, U.S.D.A., Beltsville, Maryland

Game management crew of the Virginia Commission of Game and Inland Fisheries inspected Asiatic chestnuts harvested in September, 1950, on the George Washington National Forest in Amherst County. Most of the seed collected was sown, and the resulting seedlings will be planted widely in wildlife areas on federal and state-owned lands

GATHERING CHESTNUTS used to be as traditionally American as a Thanksgiving Day turkey garnished with cranberry sauce.

There was a ready market for the nuts. Mountain folk used them for barter at stores for merchandise. They fed their pigs in chestnut groves each autumn. The nuts were also an important source of food for squirrel, wild turkey, bear, and deer because they remained sound throughout the winter—buried deep in the layer of forest leaves.

But our American chestnut was more than a nut-producing tree—it was a multiple-purpose tree. In its commercial range, it was not only the most abundant tree (in the Appalachian Mountains every fourth tree was a chestnut) but also one of the most rapid growing of our valuable species. Chestnut lumber was valued highly for its pleasing grain, its workability, and its durability. Poles, posts, lumber and tannin extract were all produced from the chestnuts. No other American tree was so productive of tannin—an essential raw material for the leather industry.

Within four decades, however, chestnut blight destroyed the important commercial stands of chestnut in the East. Although blighted trees continue to sprout and occasionally bear a few nuts—for all practical purposes, we have not lost the American chestnut.

When forest pathologists became aware that the disease could not be checked, they began searching for species of chestnut resistant to the blight. Plant explorers were sent to Asia (from where the blight came), to collect seed of blight-resistant species. Now they are engaged in the long, slow process of testing and selecting seed strains, as well as hybridizing them with our highly susceptible American chestnut: they are searching for strains or hybrids that will have all the good qualities of the American chestnut and the all-important characteristic of blight resistance.

But the problem of establishing blight-resistant chestnuts in our eastern forests is beset with many complex problems. Of the many kinds of Chinese chestnuts, only certain strains offer possibilities of becoming forest trees. Getting these established in forests where the American chestnut was so prominent is also a very difficult procedure. As our chestnut was being destroyed by the blight, the openings created in the forest canopy were soon stocked naturally by desirable but slower-growing oaks. It was not necessary to restock the forest stands by artificial planting. Federal and state foresters, as well as farmers, eagerly accepted the Asiatic chestnut planting stock offered them by the U. S. Department of Agriculture in the early thirties. However, many of their plantings were doomed to failure from the very beginning, because the cooperators often planted them in dry, grassy areas, having infertile, shallow soil. Another serious contributory factor in poor establishment was the severe droughts in the early thirties.

The Division of Forest Pathology planted Asiatic chestnuts from various regions in climatic test plots in eight eastern states from 1936 to 1939. Many of these Asiatic chestnuts were not winter hardy. When planted west of the eastern mountain range, and in northern Pennsylvania, New York, and the New England states, Japanese chestnut, seguin chestnut, and the forest-tree Henry chinkapin were soon killed out. Even some of the Chinese chestnuts, as well as certain hybrid chestnuts, have not proved to be winter hardy. Fortunately, a few Chinese chestnuts and some of the hybrid crosses show great promise. The best Chinese chestnut discovered thus far, as determined by performance in test plots and several plantations established in 1926, is P. I. 58602.

Results from these plots also show that the optimum range of development of Asiatic chestnuts does not coincide with that of the American chestnut or of our native chinkapin species. The American chestnut grew

*Dr. Diller is a pathologist, with the Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Maryland.

Locations of Asiatic chestnut climatic test plots on map showing Plant Growth Regions. The commercial range of our American chestnut was principally in Region 27; the Japanese chestnut is restricted to fertile soils in Regions 28, 29, and 30; the Chinese chestnut has a much wider range of adaptability, apparently reaching its optimum development in Regions 25 and 27, although also adapted to 22, 28, and 29. It requires better site conditions than our American chestnut. All Asiatic chestnuts in two plots located in Region 30 have failed

principally in the mountains and foothills of the eastern United States (in Plant Growth Region 27). Some of the chinkapins also occur in this region and in Plant Growth Region 30. The Japanese chestnut is restricted to fertile soils in the more temperate zone along our eastern seaboard and the Gulf States (in Plant Growth Regions 28 and 29). The Henry chinkapin and the seguin chestnut also do best in Regions 28 and 29. The Chinese chestnuts have a much wider range of adaptability and do well in the Middle West, especially in the southern part of Indiana and Illinois, in southeastern Missouri, and on well chosen sites in the Ozarks (in Plant Growth Regions 25, and in 22, where only an occasional American chestnut tree was found or where the chestnut did not occur naturally). Certain of these Chinese chestnut kinds, however, are also adapted to the mountains and the Piedmont region (Regions 27, 28, and 29).

Neither the Chinese nor Japanese chestnut has quite the same forest-type growth as that of our native American chestnut. Asiatic chestnuts are more exacting in their site requirements. The most successful Asiatic chestnut plantations are found on cool, moist, fertile, north-facing situations. It is apparent that soils, climate, and exposure are important for good growth of the Asiatic chestnuts. They do not thrive on dry ridges, and in bottomlands they often suffer from late spring freezes. In many localities nut weevils are a serious problem, and can be controlled only by two or three spray applications of DDT. Many of the Asiatic chestnuts develop into small, round-topped trees, similar to apple trees; in the Orient, chestnuts are grown principally for nut production, with no regard for timber. The spacing should be 10 by 10 feet and the trees should be pruned, if necessary, to produce straight stems. Soil conditions are very important; chestnuts must have a good supply of moisture the year around.

In their site requirements Asiatic chestnuts are more nearly like those of our native yellow poplar, northern red oak, and white ash than like the American chestnut and the native chinkapins. With respect to tolerance to shade they are much like our northern red oak. Asiatic chestnuts can endure shade for several years, and when released from shade they make rapid recovery from suppression. They are not nearly as tolerant of shade, however, as shellbark and pignut hickory, white ash, sugar maple, or beech.

There are two methods of planting chestnuts in the forest: (1) direct seeding (planting nuts), and (2) transplanting 1- or 2-year-old seedlings. The superiority of planting seedling stock, over direct seeding, as a method of planting, was demonstrated in an experiment initiated in 1939. A total of 150 1-year-old seedlings and 150 nuts (all of which were Chinese chestnut P. I. 58602) were planted on cleared forest lands in 14 plots in the Coastal Plain, the Piedmont, the southern Appalachians, and the Middle West. At the end of the eighth year, at each location, establishment and development of the trees originating from the 1-year-old seedling transplants were better than those originating from planted seed, and their average survival was much greater.

For planting, a spade or shovel may be used, or in rocky soil a heavy mattock. Anyone who has successfully set out young fruit trees will have no difficulty in planting chestnuts.

The best method thus far developed for establishing a Chinese planting under forest conditions is as follows: Select a sapling to pole-size forest stand having rich soil as indicated by the presence of the following plants: (a) tree species—yellow poplar, northern red oak, white ash, sugar maple, basswood, butternut, yellow birch; (b) shrub species—spice bush, Hercules club; (c) herbaceous species—maidenhair fern, Jack-in-the-pulpit, bloodroot, squirrel corn and Dutchman's breeches. Usually on such sites there is a good thick layer of leafmold. Preferably the site should be on a gentle (5-degree or more) slope with either north or east exposure, rather than south or west. Underplant the area with approximately 50 1- or 2-year-old Chinese chestnut seedlings in a block arrangement, using a 10 by 10 foot spacing interval.

Immediately after planting, girdle or poison all overstory woody growth that is 5 feet and over in height, not only on the planted area, but also for a distance of 20 feet beyond, on all four sides of the planted block. If poison is used keep chemical away from the soil where the chestnuts are planted—the Chinese chestnut is extremely susceptible to chemical poisoning. As the girdled trees die, they gradually yield the site to the

planted chestnuts in a transition that does not greatly change the ecological conditions, particularly of the forest floor. Rapid disintegration of the leafmold is prevented by the partial shading, which also hinders the development of sprout-hardwood competitors. From then on, provided a good job of girdling was done, the chestnuts will require little maintenance.

After the plantation is established, there are still other hazards. Where there is a heavy population of rabbits on the area, they will cut off the young chestnut stems unless they are protected with cylinders of wire hardware cloth. This hazard will prevail for at least two or three years after planting. Grazing and browsing animals, such as domestic livestock and deer, if allowed to browse upon leaves and tender shoots and to trample the trees, will cause them to become crooked, branchy, and dwarfed. If the pasturing or browsing is continued, the trees will eventually be killed. Fire, also, is very destructive to chestnuts, although Asiatic chestnuts possess the ability to put out coppice sprouts, so characteristic of our American chestnut.

The Asiatic chestnuts could become an important wildlife food in the eastern United States. Local residents living near a 55-year-old, 12-acre, Japanese chestnut plantation in northern Virginia claim that each year the best squirrel hunting in the county is in and closely adjoining this old plantation. Numerous volunteer Japanese chestnut seedlings—some of them several inches in diameter (DBH) and ranging from 20 to 30 feet in height—occur at considerable distances from the plantation, indicating that even though the seed is very large, it is readily disseminated by natural agencies.

Several years ago, an attempt to establish Asiatic chestnuts in a forest by direct seeding failed because the unprotected planted nuts were promptly eaten by rodents. Teeth marks on fragments of chestnut seed-

A 16-year-old plantation of Chinese chestnut on the George Washington National Forest, Amherst County, maintained as a future seed source for extensive plantings on federal and state game lands. The seed from which these trees originated was transported by camel caravan from beyond the "Great Wall" in northern China

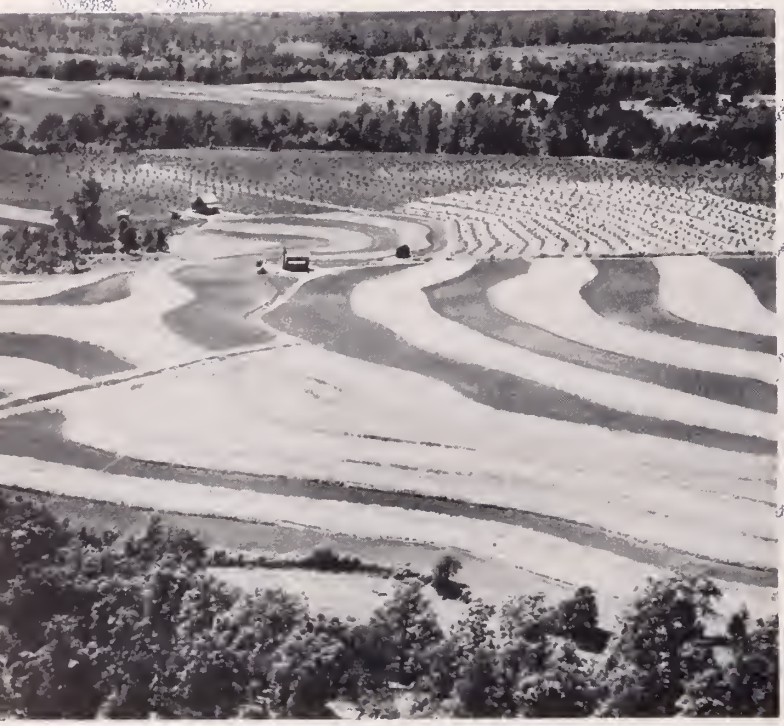
Locations of one-quarter acre demonstration plots of Chinese chestnuts and hybrid chestnuts. All plots were established by the under-planting and girdling method, which usually required little maintenance

coats lying about indicated that not only squirrels, but other rodents, such as chipmunks, field mice, moles, and even woodchucks, had eaten the nuts. Protecting the nuts with a No. 2 tin can (cross cut in top and open at bottom) increased the survival fourfold; but, as pointed out earlier, planting 1- and 2-year-old chestnut planting stock offers greater possibilities of successful establishment.

Chestnuts planted for wildlife purposes alone should receive full exposure to sunlight to insure maximum fruiting; but even so, in order to have a successful planting, the trees must be planted on very good soil with good moisture relations. Dry ridge sites will produce only stunted trees; in bottomlands, the trees often suffer from late spring freezing, with the result that seed is seldom produced. Only Chinese chestnuts that have proved to be blight-resistant, timber producing, and climatically suitable should be planted; the seed from such trees will be disseminated by natural agencies into the adjoining forests—sometimes as far as ¼ mile from the Asiatic chestnut parent trees.

Since Asiatic chestnuts must have deep, fertile, well-drained soil, with adequate moisture, extensive plantings of valuable forest or farm lands are not economically feasible. Most farm wood lots, however, have limited places that would accommodate a small block planting of 25 to 50 Chinese chestnuts, spaced 10 by 10 feet. Such a planting would serve as a seed source from which natural agencies could disseminate the seed to other parts of the woodland, thus introducing another forest-tree component that is decay-resistant when used as posts or poles, a wood that is rich in tannic acid, and a valuable wildlife tree.

HERE ARE THE SOIL SAVING PRACTICES THAT KEEP YOUR TOPSOIL AT HOME ...SAVE WILDLIFE



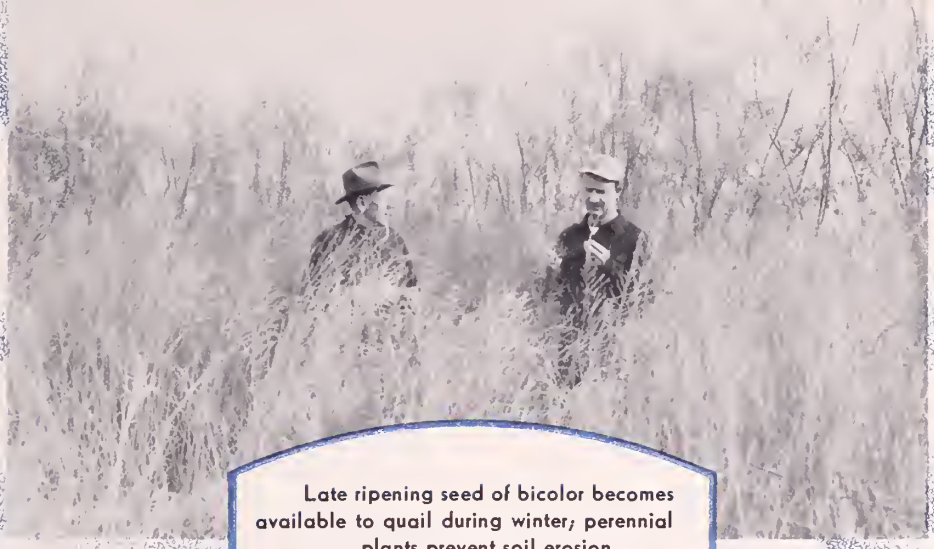
Farming on the contour saves soil, allows for practical rotation, enhances food for wildlife

Photo courtesy S. C. S.

Proper land use provides maximum utilization of all cla of land. Note pond, woo cropland and pasture

No erosion here. stead a well-protec right-of-way and a n ral cafeteria for qu Planting is bicolor pedeza

Commission Photo by Kes

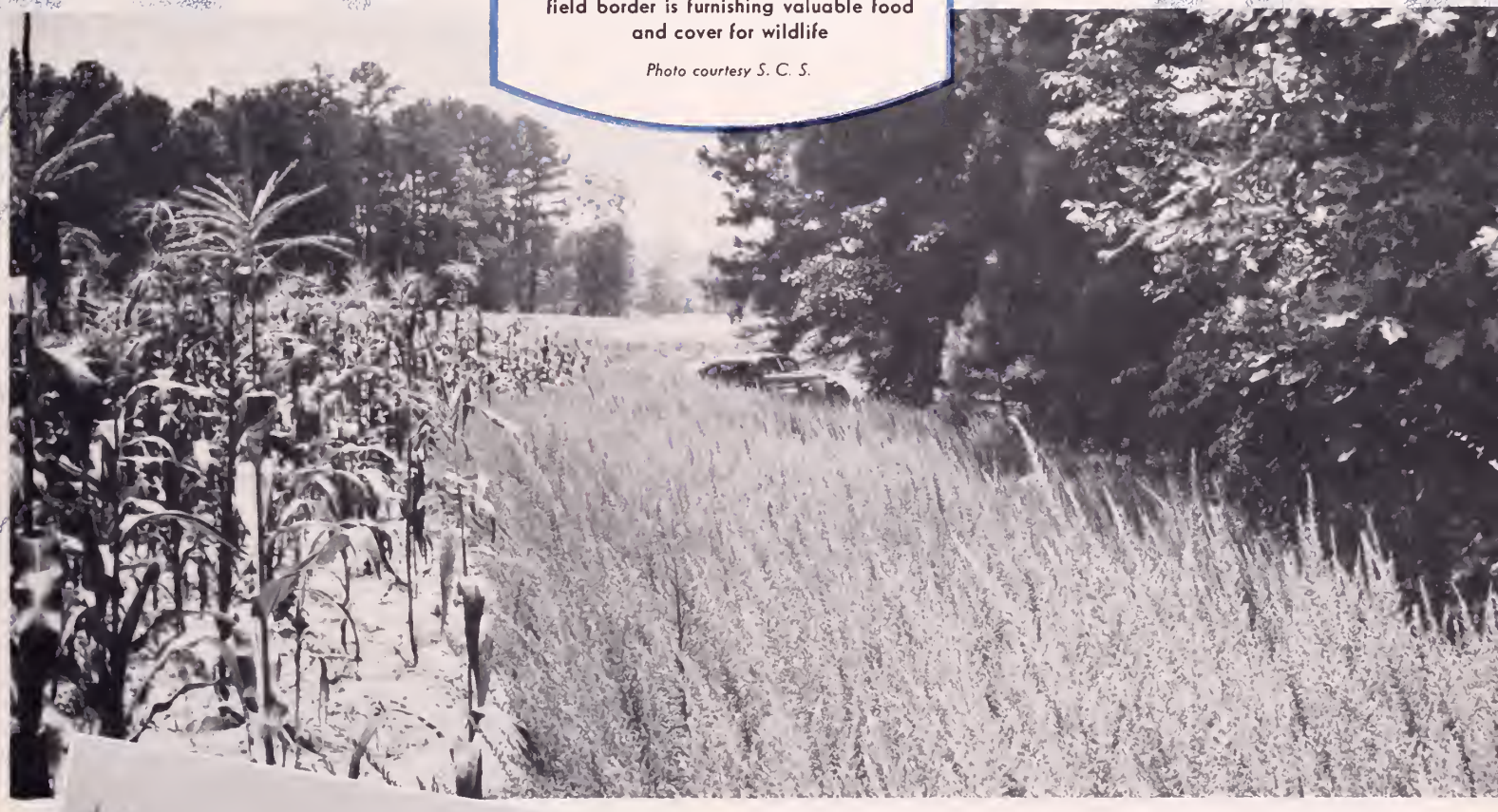


Late ripening seed of bicolor becomes available to quail during winter; perennial plants prevent soil erosion

Commission photo by Kesteloo

Planted between crops and woods, this field border is furnishing valuable food and cover for wildlife

Photo courtesy S. C. S.



Small feed patches in neglected corners can mean more game

Standing corn holds soil in place, becomes the all-perfect food for game

62,000 Additional Acres of

WITH THE FILLING of the giant Buggs Island Reservoir expected by next spring, Virginia will have acquired over 62,000 acres of new fishing waters within a three year period.

The South Holston Reservoir, newest in the chain of T. V. A. lakes, was turned over to anglers this spring. Thousands of eager fishermen were on hand to greet the official opening of the season in this 8,000-acre impoundment which is shared jointly by both Virginia and Tennessee.

Smallmouth and largemouth bass, redeye, crappie, bluegill, and carp are furnishing a wide variety of excellent fishing for residents in the southwestern part of Virginia. A creel census program, established by your Commission as a part of an overall plan to keep tab on the fishing potentialities of our waters, brought to light that the fishermen interviewed on opening day caught fish at the amazingly high rate of over two fish per hour. This figure represents an average of all fishermen including both novice and seasoned anglers. The fishermen were especially pleased with the abundance and large size of the redeyes entering the creel.

Residents in Franklin, Henry, and Patrick counties are looking forward to the filling of Philpott Reservoir, a multipurpose reservoir, located near Bassett, Virginia. The Corps of Army Engineers reports that this 25,000-acre impoundment will be completely filled in time for next year's fishing season.

A survey of the Smith River made last year at the site of the present impoundment revealed that sufficient adult brood fishes of smallmouth bass were present to successfully propagate the reservoir with this species without stocking. The scarcity of largemouth bass noted during the study of this headwater stream indicated that the reservoir would profit by an initial stocking of brood fishes. Thus, 600 adult largemouth bass were stocked.

At the present time the reservoir contains almost a thousand acres of water. Preliminary investigation this year has indicated that reproduction by the major game fishes, especially the largemouth bass, has been phenomenal. If the growth of these fishes is as fast as is expected, next year's fishing season should open with a bang. It is expected that redeye and smallmouth bass fishing will be particularly good for the first few years. Smith River, on which the impoundment is located, is a noted smallmouth bass and redeye stream.

Largest of the projected impoundments to be located within the state, the 51,200-acre Buggs Island Reservoir, located in the heart of the Piedmont region near Clarksville, will begin to fill in late fall of this year or early spring of 1953. As it will require at least a year for the fishes to attain fishable size, after being spawned, fishing in the reservoir will not be attractive until 1954.

Although investigation of the Roanoke River at the site of the impoundment showed an abundance of gar, carp, and other rough fishes, the change in environment occasioned by impoundment of the stream will keep their numbers at a minimum within the new reservoir. Game fishes, on the other hand, should benefit greatly by impoundment. A pre-impoundment survey brought out that sufficient numbers of largemouth bass and other game fishes were present in the river to insure adequate reproduction after impoundment. If the water of the reservoir is as clear as is expected, largemouth bass, crappie, and the bluegill will soon become favorite targets for anglers. The collection of several walleye pike from the river indicates that this fine game fish may in time also become an important constituent of the sport fishes of the reservoir.

A preview of what may be expected in the Buggs Island Reservoir was furnished by the filling last year of Island Creek Reservoir, a 450-acre sub-impoundment to the larger reservoir. This sub-impoundment, located approximately 15 miles southwest of Clarksville, on the Virginia-North Carolina border, is furnishing excellent largemouth bass, crappie, and bluegill fishing. Largemouth fishing and bluegill fishing were particularly good in the early part of the season, but with the advent of hot weather in late June and July, fishing declined. At the present time, the crappie is supporting the bulk of the catch. Another species commonly entering the

Philpott Reservoir, a 25,000-acre impoundment located near Bassett, should be completely filled in time for fishing next spring

Fishing Waters

By ROBERT G. MARTIN
Fish Technician

Commission photos by Kesteloo

creel is the chain pickerel, or jack-pike as it is more popularly known. This species, a first cousin of the celebrated northern pike, is equally as game as its yankee cousin. Several pickerel weighing over three pounds have been reported captured this season. It is not probable, however, that the pickerel will become abundant within the larger Buggs Island Reservoir. The fluctuating water levels of this flood control and power producing reservoir will prevent the establishment of aquatic vegetation necessary for the propagation of the vegetation spawning pickerel.

If past experience is to be trusted, the fishermen of Virginia are in store for some of the best possible lake fishing during the next few years. It is not only because of the vast acreages involved in the creation of these new reservoirs that this statement is made. Fishermen and biologists alike long have noted that the quality of lake and pond fishing is much higher for the first few years of their existence than in later years. Many of the more casual fishermen have taken this fact for granted and have given little thought to the reason or cause behind this observation. To the serious dyed-in-the-wool fishermen and to fisheries biologists, however, the factors responsible for this condition offer a serious challenge. One such reason for this situation is that new waters, like virgin soils, contain a high percentage of organic materials and other fertilizing elements. In addition to the inherent fertility of the watershed, these fertilizing elements are supplied by the decomposition of the grasses, shrubs, and even crops which originally covered the reservoir basin. This bonus of fertility furnished by the vegetative cover of the reservoir bottom is quickly translated into a large fish population which is, in turn, reflected by an increased harvest by fishermen. After a few years this high fertility is exhausted and the reservoir must fall back to the level of the fertility of the watershed. This does not mean that fishing will not still be good in older reservoirs, but only that it cannot be expected to rival the first few years.

Another factor which may contribute to the high quality of fishing, observed for new waters is the relative size distribution of the bass population. Naturally, new waters contain a heavy proportion of young fishes in the populations. Also, since there are few large bass of the "tackle busting" variety, competition for the available food is at a minimum and the young fishes grow at prodigious rates. In fact, the bulk of the newly spawned basses will attain 10 inches within their first year. Thus, in new waters we have large numbers of relatively small, but highly "catchable" fishes with only a sprinkling of the large "tackle busters" and those too small to be attractive to fishermen.

South Holston Reservoir, newest in the chain of T. V. A. lakes, was turned over to anglers this spring

As the impoundment ages, the relative proportion of large bass continues to increase, but only at the expense of the numbers of the smaller fishes. At the same time the growth rates of the bass decline. In many of the older impoundments in Virginia it requires from two to three years for newly spawned bass to attain 10 inches. The situation pictured above for the old impoundments results in a bass population dominated by larger, but fewer bass, and which also contains a relatively high proportion of bass too small for the consideration of most anglers.

Buggs Island Reservoir before completion. It is expected that this giant reservoir will be filled and ready for fishing by next spring

The American Chinchilla in Virginia

By J. F. SIMPSON

In 1936 the chinchilla was introduced to eastern United States and a small herd was established in the Shenandoah Valley in Virginia

Commission photos by Kesteloo

A SMALL BUNDLE of nervous energy with sparkling black eyes, a bushy tail and a coat of blue-gray fur, indescribable in beauty, is the American ranch-raised chinchilla. This fascinating handful of South American rodent is slowly but surely coming back into his own after near extinction soon after the turn of the century.

An enterprising young mining engineer on duty in South America in 1921 became interested, through the natives, in the shy little animal whose pelt had been the envy of kings the world over. After a two-year trapping program, he succeeded in securing a small herd to bring back to the United States for breeding experiments. Following a harrowing trip across the Equator, where those animals which endured the extreme heat lost their fur, he arrived in California in 1923 with 11 weak chinchillas, only three of which were females. That was 29 years ago. Today the chinchilla is a healthy, hardy, productive animal with a lucrative future in store for his breeder.

In 1936 the chinchilla was introduced to the Eastern United States and a small herd was established in the Shenandoah Valley in Virginia. There are in Virginia today some 40 to 50 ranches in operation with Virginia leading the east coast states in this new and fascinating industry.

The ultimate goal of all chinchilla breeders is a pelt market for the future similar to, and competing with, the already successful mink business. Toward this end, the chinchilla breeder is working with diet improvements, fur quality improvement, prolificness, increased size and the reduction of disease and mortality. This program is operating under the untiring guidance of the National Chinchilla Breeders of America, Inc., with a sizable financial outlay made available annually for a thorough and extensive research program.

Chinchillas breed on the average of twice a year with an average litter of two babies, however three or even four in a litter is not uncommon. The gestation period is 16 weeks (the same as a lion) and the young ones arrive fully furred, with a complete set of teeth and their eyes open. In about four hours they are jumping around their cage and in three to seven days are eating solid food although they nurse until they are 60 days old. At this age they are weaned from the mother and put on their own to take their place as future breeders.

The chinchilla diet is a simple one consisting of pellets, hay and water. This is found to be quite successful as well as economical. There are several good chinchilla pellets on the market and a portion per day per animal with a handful of good timothy hay or alfalfa is sufficient. Fresh, clean drinking water is provided daily and cleanliness maintained at all times.

Chinchilla fur is quite unlike any other fur. In its structure it is as fine as spider web with as many as 80 fur fibres growing from each follicle or pore, creating a

softness and texture to be compared with no other furbearer. In color, each hair of the fur shows three tones or phases. Growing from the skin is a wide, slate-blue underfur—then a white band of about one quarter of an inch, tipped with a black veiling, covering the entire animal down to a pure white belly. This gives the chinchilla a beautiful blue-gray appearance with a flash of white which, when combined with the skill and art of the furrier, produces a garment of incomparable beauty, not to be imitated—for the texture and color defy the most clever dye artists. Authentic chinchilla will always stand by itself, featuring clearness of color, beautiful texture, durability and lightness of weight. A large pelt weighs but a single ounce—a complete coat a scant three pounds.

World consumption of chinchilla exported from South America at one time exceeded half a million skins per year and the future will certainly demand at least that many—perhaps more. With approximately 225,000 animals in existence today, it is quite apparent that a long waiting period of growth lies ahead for the new rancher. There are unlimited possibilities for further expansion of ranches almost anywhere in the state of Virginia, where climate is nearly ideal for raising the breeding stock so much in demand all over the country. The main requirements are a genuine interest in the animal and an understanding of his habits, combined with a reasonable amount of perseverance and an atmosphere of quiet and cleanliness. The animal responds nicely when given individual attention. For this reason the chinchilla of the future may well come from thousands of individual ranches rather than from mass breeding farms where such attention could hardly be possible. By learning a few simple rules, almost anyone can raise chinchillas. They are as easily cared for as any valuable livestock and much less trouble than most. Probably the cleanest animal in existence, they have no odor whatever and make very little noise. These characteristics alone make it possible to raise chinchillas in either the city or country, wherever pets of any kind are legally permitted. Of all the fine furbearers, this is true only of chinchillas and, being the vegetarian that he is, he thrives on a simple and plentiful diet.

Even though they originally come from the high altitudes of the South American Andes Mountains, it is not necessary to duplicate this condition in North America. From the time of the animal's first arrival in the west, he was slowly moved to lower altitudes from the mountain tops of California—year by year for a decade. A naturally hardy animal, the chinchilla has become well adjusted to nearly all climatic variations of the United States. The main precaution to be taken in this respect is care against dampness and sudden temperature changes. Although a high Fahrenheit reading can be dangerous (above 80°) the amount of cold that a chinchilla can stand seems limitless, although drinking water should not be allowed to freeze. As with most furbearers, cold weather seems to increase the fur density, and breeding is more active. Humidity should be kept in check as this may cause the hay to mould, which, if consumed, could prove fatal.

Perhaps the most important event in the life of every chinchilla is his daily dust bath. This is accomplished by supplying each cage with a shallow pan about half filled with powdered Fuller's earth, a very inexpensive product, in which the animal rolls and preens himself much like a bird does in the dust along a country road. This daily dusting, usually for about half an hour, keeps the fur fine and silky, free from excessive body oils and seems to separate the fine fur fibres—one from the other—giving a lustre and resilience to the already beautiful texture. The dust also has a cleaning property which, in time, removes pen stains from the animal and, over all, makes him feel refreshed. To overlook the daily bath is something Mr. Chinchilla meets only with disappointment and will give himself an even more vigorous going-over when he finally gets in.

The female is the ruler of the cage, and, being larger

(*Continued on page 22*)

The main requirements for raising chinchillas are a genuine interest in the animal and an understanding of its habits

Of all the fine furbearers, the chinchilla alone is without odor and noise, making it possible to raise it in city or country

Effects of the RED FOX on other game*

By F. NELSON SWINK, JR.

Photos courtesy H. S. Mosby

THE EFFECTS of the red fox population on other game species has been investigated on the 2,300 acres of the V. P. I. College Farms during the period January, 1951, through March, 1952. Various phases of the problem have been considered; one of the more important aspects has been concerned with the food taken by the fox. This writing is concerned primarily with the results of the food habits investigation.

Three techniques may be utilized to determine the food habits of foxes; first, by an examination of the contents of the digestive tract; second, by observations in the field of the food items taken by the fox and, third, by the examination of scats, or fecal passages. I have dealt only with the feeding trends of the red fox on the V. P. I. College Farms as indicated by the examination of fecal passages.

The determination of foods taken by foxes as shown by scat analysis has certain limitations. It is generally conceded, however, that scat analysis will show the trends in feeding and that it permits the sampling of these trends without sacrificing or disturbing the species under investigation. The scat collection was made by the writer and the time spent afield collecting the specimens afforded an additional opportunity to relate the food items found in the scats with the availability of food items in the field.

In this type analysis the percentage of occurrence is the accepted standard used to evaluate each food item in the diet of the foxes, since the actual volume can be inaccurate and misleading. Obviously three mice would not represent the same volume of food consumed by the fox as would one cottontail rabbit.

A total of 77 food items were identified in the analysis of 549 scats collected at regular intervals throughout the 15-month period from January, 1951, through March, 1952. Only those items of food which occurred a significant number of times to be of importance in the diet of the fox will be discussed here. For convenience, the following discussion will be concerned with the mammalian, avian, invertebrate, and plant foods.

General Feeding Trends

The food habits patterns of red foxes have been investigated by several writers in the United States, and by a lesser number in Europe. The basic feeding trends on the study area at Blacksburg were found to be somewhat different than those found by other investigators, but generally follow the same pattern.

The major mammalian food item was the meadow mouse. This mammal occurred 289 times (52 per cent) in 549 fecal passages. The highest monthly occurrence was in May when pups are just coming out of the natal den and learning to hunt for themselves.

The meadow mouse is particularly vulnerable to foxes, and the evidence presented in this study substantiates this fact. Therefore, it seems reasonable to state that the meadow mouse is one of the preferred food items because of its abundance and apparent vulnerability.

The agricultural practices on the V. P. I. College Farms offer ideal habitat for the meadow mouse and this no doubt is the reason for relatively high populations occurring on the study area. Most of the area is in pasture or crops, thus affording the mouse desirable habitat.

The second most important mammalian food item was the cottontail rabbit, which occurred 189 times (34 per cent) in 549 fecal passages. This mammal was also the most important species found on trails and at

*Paper presented to the Virginia Academy of Science, May, 1952. At the time Swink was a graduate fellow of The Virginia Co-operative Wildlife Research Unit, V. P. I.

natal dens. The cottontail occurred only 71 times during the winter and 50 times during the spring. It occurred only four times during the summer when plant growth offers the most protection to the rabbits. These facts follow the characteristic pattern in which the cottontail is eaten by the red fox at all seasons of the year, with a low in the summer. The rabbit is found in every type of habitat on the study area. It is of interest to note that one natal den was located that had the remains of seven rabbits around the entrances, yet, from six fecal passages picked up there, rabbit did not occur in a single dropping.

The third most important mammalian food item was the opossum. It occurred 52 times (9 per cent) during the study. The period of maximum occurrence was in the winter, when it appeared 34 times. This mammal is also vulnerable to the fox and this fact probably accounts for the relatively high occurrence in the foxes' diet. The opossum is fairly abundant on the study area, but no estimation of the population was made.

Strangely enough, the next item was the striped skunk, occurring 19 times (3.5 per cent) during the investigation. The largest occurrence was in the winter (16) as would be expected, for the skunk and the fox would naturally be seeking den sites at the same time and this fact would lead to conflict between these species. Normally the fox probably does not bother the skunk, for the obvious reason.

The fifth most important mammalian item was the white-footed mouse, which occurred 19 times (3.5 per cent) during the study. It occurred at all seasons of the year, except the summer. It is strange that this mouse did not occur more frequently, for it undoubtedly is present in fairly large numbers in the wooded sections of the study area. Several other investigators have also found that this mouse usually occurs in the diet more frequently during the winter. The habits of the white-foot may be the reason for its apparent immunity to fox predation, for it is strictly nocturnal in habit. On the other hand the meadow mouse is found in the field at all hours. The exact population ratio between the meadow mouse and the white-footed mouse is unknown, but it is my opinion that the meadow mouse is at least ten times more abundant than the white-foot on the study area.

Students from the Co-operative Wildlife Research Unit at V. P. I. dig out a red fox den to study foods brought in to pups during late spring

Red fox pup found in one of the observation dens

Of lesser importance are the following mammals: Mole, short-tailed shrew, New York weasel, least weasel, house cat, red fox, woodchuck, chipmunk, harvest mouse, common rat, gray squirrel, domestic pig, domestic dog and domestic sheep.

Of all avian food items, the domestic chicken appeared most frequently. It occurred 36 times (7 per cent) during the investigation. The highest occurrence was during the spring, as would be expected with pups in the den. This item was at all times readily available to the foxes, as several thousand chickens annually are produced on the V. P. I. College Farms, and it is surprising that they did not take it as a food item more often. I believe that most of the chickens taken were carrion, for chickens were often thrown out of the poultry plant by the laborers and thus made available to the foxes. Several complaints were registered with me concerning foxes raiding the chicken houses, but after trapping for several nights, the only trespassers caught were three skunks and one opossum.

Evidence that the bobwhite quail was eaten by foxes was present in only one of the 549 fecal passages examined. This does not tend to reflect a true picture of the pressure exerted by the fox upon the quail, however, as it is known that seventeen quail were killed by foxes over the 15 months of the study. Of these, twelve were found in the field where they had been killed, two were found at den sites and three quail were taken by foxes from quail traps used in a quail study.

Some researchers have demonstrated that predation losses among quail in the winter normally are from that segment of the quail population that is in excess of the carrying capacity of the range. If this is true the fox actually benefits the quail population by removing some birds from competition.

Therefore, it is possible for relatively high populations of quail and red foxes to live harmoniously on a range of restricted size without any serious effects upon the quail population.

The following birds also appeared in the diet of the fox, but did not occur frequently enough to indicate serious predation by the fox: mourning dove, mallard duck, crow, pigeon, starling, meadowlark, cowbird, mockingbird, cardinal, red-winged blackbird, song sparrow, rusty blackbird and brown thrasher.

Invertebrate animals made up a relatively high percentage of the warm weather diet of the fox on the study area. The invertebrates were represented almost exclusively by insects, only two of which are of importance, the Orthoptera and the Coleoptera.

Among the Orthoptera the grasshopper made up 27 per cent, by occurrence, of the diet. It occurred 151

times during the study, and appeared at all seasons. Late summer and fall were the seasons at which the grasshoppers were the most important in the foxes' diet. Fecal passages were often collected at woodchuck dens in the fall, indicating the grasshoppers were substituting for mammalian food items in the diet at that period. The grasshopper is strictly a seasonal item that apparently is relished by foxes, as indicated by the large number of occurrences in fecal materials. This item was the third most important food item in the diet.

Carabid beetles appeared at all seasons of the year, the larger percentage occurring in the summer and fall. This item occurred 74 times (13 per cent) in all. The occurrence is thought to be low, for large numbers of beetles were available on the study area at all times.

Several other insects were identified in the fecal passages; among them are: Scarabaeid beetles, Buprestid beetles and Curculionids.

The number of species of plants that occurred in the foxes' diet was surprisingly high. As was expected, the occurrence of plant materials is almost restricted to the summer and fall periods.

A major exception to the seasonal occurrence of plant materials is orchard-grass, which appeared at all seasons of the year in fairly large quantities. This grass appeared 164 times during the investigation. This grass is readily available to the foxes at all seasons of the year on almost every section of the study area. Other grasses occurred in the fecal materials but were relatively unimportant in the diet, because of the small quantities that appeared.

"This isn't my idea of hunting—there isn't a stray man in miles"

Wild cherry, an important seasonal food item of the red fox, appeared 66 times (12 per cent) during the study. Nearly 90 per cent of these occurrences were in the early fall. The fox is known to travel long distances to obtain cherries and to gorge himself with them. Occurrence seems to indicate that this food is highly preferred by foxes when it is in season.

Of minor importance are the following plant foods of the fox on the study area at Blacksburg: Wild grape, pokeberry, blackberries, plum, corn, apple, black haw, tomato, horse nettle, ground cherry, burdock, grapefruit, Korean clover, ragweed, bur-marigold, medick, crab-apple, greenbrier, persimmon, bush lespedeza and sweet cicley.

Conclusions

In conclusion, I am of the opinion that predation on game mammals and birds, by foxes, is negligible. The cottontail rabbit is taken frequently, but the rabbit is apparently able to withstand the pressure placed upon him by foxes.

The bobwhite quail apparently suffers only slight predation and is not affected seriously by the foxes.

The rodents seemingly bear the brunt of predation, however, all evidence indicates that rodents are capable of relatively high populations despite fox predation.

THE AMERICAN CHINCHILLA IN VIRGINIA

(*Continued from page 19*)

than the male, she exercises her advantage in most decisions. They are jealous of their mates and do not care for competition from other females. For this reason, chinchillas are usually mated for life, unless a finer fur quality is evidenced by re-mating for herd improvement. She is an excellent mother and seldom needs any assistance in bearing or bringing up her young, although the male is ready at any time to protect the babies and keep them warm.

The domestication of the chinchilla is a new chapter in the story of fur farming and animal husbandry, this unusual and greatly sought after pelt being assured a prominent place in the fur market of tomorrow. Other creatures such as the fox and mink have been domesticated from unlimited wild stock supplies, whereas the American chinchilla has sprung from a position where only 11 animals stood between the survival and the extinction of the species. Fortunate is the man or woman who owns even a single pair of these animals, for all the world wants chinchilla fur and only America produces it. From the brink of oblivion, the chinchilla we see on a few ranches in Virginia today is well along in its wide program of rehabilitation—spreading throughout America, the pride of its owners, the envy of all other fur.

HUNTER-SAFETY POSTERS DISTRIBUTED

Virginia's annual campaign for hunter-safety education got off to an early start last August when 7,500 safety posters were distributed to game wardens throughout the state.

Wardens received instructions to post them in conspicuous places in their counties, along secondary roads and in known hunting areas. As an important part of the Commission's educational program, the posters will serve as constant reminders of the proper handling of firearms and will stress the need for safety afield.

It is anticipated that the volume of posters distributed will keep the safety message before the eyes of the sporting public and will cut down on the number of hunting accidents during the 1952-53 hunting season.

Field Force Notes

F. W. HOTTLE LEADS IN CONVICTIONS

The enforcement officer who led the entire force in the number of convictions recorded for the past fiscal year was Fred W. Hottle, a member of the Commission's flying squad. Hottle obtained 241 convictions for game and fish violations and assisted wardens in obtaining 61 additional convictions. Hottle's headquarters are maintained in Shenandoah County and his activities are confined to counties west of the Blue Ridge.

A total of 4,016 game and fish law convictions have been recorded for the past fiscal year. There were 40,025 dogs destroyed and 3,197 convictions for violations of the dog law during the same period.

PULASKI CLUB RELEASES ALBINO RACCOON

As a part of their wildlife restoration program, the Pulaski County Sportsman's Club released the albino raccoon, pictured here, shortly after the close of the last season.

V. S. Douthat, president of the club, reports that the 'coon was not a true white but a light yellow, having no mask and barely discernible rings on its tail.

An albino raccoon released in Pulaski County

The 'coon is one of 225 released by the club in the past three years with the help of the Commission.

A BORN NATURALIST

From all indications four-year-old Thomas Herring Forrer, Jr. will follow in the footsteps of his great grandfather, Thomas (Uncle Tom) Herring, game commissioner of Dayton.

Like a true conservationist, young Thomas released the captive bunny pictured here so that it could return to its native habitat around the Herring farm. The Game Commission has always discouraged the keeping of wildlife in captivity.

Tommy Herring Forrer, Jr.

RESULTS OF AERIAL CENSUS ANNOUNCED

An aerial census of Tidewater Virginia's waterfowl nesting area was made during late July as a basis for determining average waterfowl populations.

Charlie Gilchrist, Commission game technician who flew the area, reported 6 black ducks, 65 wood ducks and 4 mallards seen on 100 miles of line on 8 creeks. Recorded on 500 miles of line on 7 rivers in the Tidewater section were 93 black ducks and 136 wood ducks.

In cooperation with Maryland and Delaware, the census was made to gather index figures for use by the states, the Atlantic Waterfowl Council, and the U. S. Fish and Wildlife Service. The aerial survey lines, covering a known area, will supply Service statisticians with information from which the average population of waterfowl nesting in Virginia can be computed.

REWARD FOR MERITORIOUS SERVICE

As a reward for services to the advancement of scientific study, two deer were recently put out to pasture in the grounds of the Radford Arsenal in Dublin, Virginia. The deer, picked up as orphans and raised at the Cumberland Game Farm, were turned over to the V. P. I. Wildlife Research Unit for use in a research project on the food habits of deer in the mountains of western Virginia.

Because the deer were too tame to release in the woods after completion of the study, they were rewarded for their aid to science by being placed in the protected grounds of the Arsenal. These two deer, one a buck and the other a doe, will join six other deer released in the several thousand acre enclosure of the Radford Arsenal last winter.

Game manager Webb and wildlife student Gordon Brown turn over two new charges to Colonel Spencer and Captain Rood of the Radford Arsenal

COMMISSION AND GRANGE COOPERATE

To members of the Virginia Grange, the following statements by I. T. Quinn, executive director of the Commission, will be of interest. Mr. Quinn, in a letter to Earl J. Shiflet, state deputy of the Virginia State Grange, made the following statements on the cooperative work between the respective agencies:

"The Virginia Commission of Game and Inland Fisheries recognizes the fact that the Grange membership is comprised of farm landowners who are interested not only in high yields of agriculture crops and profit-making livestock, but its membership strives to place community interest above the interest of the individual.

"In the promotion of community interests, the Grange has the wholehearted cooperation of the Commission of Game and Inland Fisheries. The Commission realizes that the wildlife of fields, woods and waters constitutes a great asset to any community. To this end it dedicates itself to the task, in cooperation with members of the Grange, of promoting wildlife conservation through the improvement of habitat.

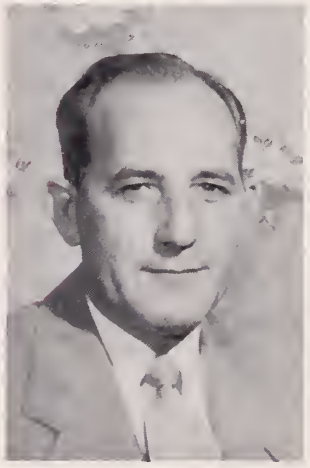
"In its improvement program, the Commission is glad to supply, without cost to the landowner, suitable plants and seeds to be planted as food crops for wildlife. It is recommended that these plants and seeds be planted along field borders and at other places where they will, while producing food for wildlife, assist in the prevention of soil erosion.

"The Commission maintains a motion picture library. Films dealing with game, fish and other rural life problems are available without cost to the Grange and to other groups and organizations.

"We of the Game Commision want the Grange to know that we stand ready to serve its membership at all times in our special field of activities."

KARGER TRANSFERRED TO PHILADELPHIA

Supervisor Ernest M. Karger of the George Washington National Forest with headquarters at Harrisonburg has transferred to Philadelphia, Pennsylvania, headquarters for the Eastern Region of the U. S. Forest Service. Mr. Karger is promoted to the position of assistant regional forester in charge of personnel for the Region which extends from Maine south through Virginia and west to Kentucky. The promotion was effective September 1.



E. M. Karger

The 1,000,000 acre George Washington National Forest has been supervised since February 1, 1950, by Mr. Karger. He is a graduate of Penn State and began his forestry career in 1933 on the Allegheny National Forest in Pennsylvania following a temporary assignment on the San Bernardino National Forest in southern California.

In 1936 Mr. Karger was transferred to Virginia where he served as assistant ranger, ranger and assistant supervisor of the Jefferson National Forest. In 1944 he went to Philadelphia where he served on the regional forester's staff until his transfer to the George Washington in 1950. He was one of the national forest rangers selected 13 years ago to help in the inauguration of the state-federal "Virginia Plan" for joint wildlife management on national forest areas.

Regional forester W. S. Swingler has announced that A. H. Anderson, supervisor of the Monongahela National Forest, Elkins, West Virginia, will succeed Mr. Karger as supervisor of the George Washington.

Mr. Anderson's wide experience in national forest administration assures continued progress of the George Washington program.

DAY FORECASTS FALL FLIGHT OF DUCKS

"Duck hunters can anticipate increases over last year in the fall flights of wild ducks that will range from 'slight' to 'major' varying by flyways," Albert M. Day, director of the Fish and Wildlife Service, told members of the new Waterfowl Advisory Committee who met with him and other Service officials for the first time on August 6 in Washington.

In a forecast by flyways, based on an analysis of cooperative surveys made on the waterfowl breeding grounds this spring and summer, director Day declared that "the fall flight of ducks in the Pacific Flyway will show a moderate to considerable increase over 1951 while the goose flight may be about the same.

"With increased breeding population and production, it seems definite that there will be a major increase in the number of ducks moving southward through the Central Flyway.

"The fall flight of ducks in the

Mississippi Flyway will undoubtedly show a moderate improvement over last year.

"Hunters in the Atlantic Flyway may expect a small increase in dabbling ducks and at least a moderate increase of divers this fall."

The new Waterfowl Advisory Committee is composed of representatives from a number of private conservation organizations and two delegates from each of the four flyway councils formed within the past year. These eight members, together with the president of the International Association of Game, Fish and Conservation Commissioners, are heads of state game departments. Other members of the new committee include prominent officials of the National Audubon Society, the Outdoor Writers Association of America, the Izaak Walton League, the Wildlife Management Institute, the National Wildlife Federation, and The Wildlife Society.

DISEASE THREATENS BIG GAME IN CANADA

United States hunters planning to go to Canada this fall in quest of big game were warned by Albert M. Day, director of the Fish and Wildlife Service, that recent outbreaks of foot-and-mouth disease among Canadian cattle have caused certain bans and restrictions to be placed on the transporting of all cloven-hoofed animals into the United States.

Among the game animals affected by the regulations, issued by the United States Department of Agriculture, are moose, deer, elk, caribou, mountain goat, mountain sheep and antelope. As long as the disease persists, the bringing of these animals back across the border will be prohibited.

However, small quantities of completely boned and thoroughly cooked meat from any of these animals, intended for personal consumption, may be brought back if inspected and approved by the United States Bureau of Animal Industry Inspectors at the border.

Hides or skins of these game animals may be brought into this country if hard-dried; or they may be shipped to points in the United States if consigned to an establishment approved by the Bureau of Animal Industry for proper disinfection or processing. The hides or skins in the latter case must be moved in a railroad car, truck, or tight container (can or cask) that has been sealed with United States Department of Agriculture seals.

JEFFERSON SUPERVISOR MOVES TO PHILADELPHIA

Forest supervisor Allan R. Cochran has been transferred to the regional office in Philadelphia to a staff position in the division of operation. Cochran who has been in charge of the Jefferson National Forest since 1941 is succeeded by George B. P. Mullin, assistant supervisor, White Mountain National Forest in New Hampshire.

Upon graduation from the University of Idaho in 1928, Cochran began his career of public forester as a ranger on the Olympic National Forest in Washington. Subsequently he entered Yale and received his M. F. degree in 1930. Prior to coming to the Jefferson, Cochran served in an administrative capacity on the White Mountain National Forest in New Hampshire, the Allegheny National Forest in Pennsylvania and the George Washington National Forest in Virginia.

A. R. Cochran

In this period the Jefferson National Forest has seen the development of a cooperative wildlife management with the Virginia Commission of Game and Inland Fisheries that has attracted nationwide attention. Most of the national forest has been opened to deer hunting as a result of the management program, and much has been done to restore the small game population.

Forest supervisor Mullin, a graduate of Yale in 1930 has had wide administrative experience in the U. S. Forest Service. He served as district ranger on the Clinch District of the Jefferson for two years returning to the White Mountain National Forest in 1941. Mullin transferred from Laconia, New Hampshire to make his home in Roanoke about September 1. He was accompanied by Mrs. Mullin and their four sons.

PROFESSOR PALMER LEAVES CORNELL

Professor E. Laurence Palmer, who undoubtedly has done more to bring conservation into the classrooms of America than any other man in history, has retired from the staff of Cornell University where he has taught nature study and science education for the past 33 years.

Dr. Palmer is widely known for his ability to dramatize science and nature and to reduce complex theory to simple, accurate terms. A dynamic personality and an untiring worker, he is the author of numerous publications, including several books, and has been editor of the Cornell Rural School Leaflet since 1919. He has been director of nature education for *Nature Magazine* since 1925, editor of McGraw-Hill Natural History Series since 1935, and director of conservation education for the National Wildlife Federation for the past three years. He has taken an active part in the affairs of a score of scientific and educational organizations as a member or as an officer. His largest published volume is *A Fieldbook of Natural History*, the most complete and comprehensive book ever published on nature study and a valuable reference work. Encyclopedic in scope, it covers the entire range of zoology, botany, and astronomy.

In addition to teaching, writing, serving on committees, and participating in conferences, he conducts a weekly radio program, organized in 1932. Professor and Mrs. Palmer will continue to make their home at Ithaca, New York.

Wildlife Questions and Answers

Ques.: Does skunk make good eating?

Ans.: Some autharities claim that skunks make gaad eating. It is said that the meat is white, tender, and sweet, beautifully marked with fat and lean like the finest grade af park.

Ques.: Is it possible that under excellent living conditions a raccoon would weigh as much as 40 pounds?

Ans.: Yes, raccaans weigh fram an average of 15 paunds up ta 49 paunds maximum.

Ques.: How does the otter rank as a valuable furbearer in Virginia?

Ans.: Althaugh atter fur is the mast durable American fur and brings a good price, the atter is taa rare in Virginia ta rank as an impartant furbearer.

Ques.: How many fawns does a doe bear at one time?

Ans.: The dae has fram ane ta three fawns at a birth, but as a general rule she has twins. They are barn fram late May ta early July.

Ques.: Where are the Commission's fish hatcheries located and are they open to the public?

Ans.: The Cammissian's traut hatchery is lacated at Marian, the traut nursery at Montebella. One of the twa smallmouth bass hatcheries is lacated at Waterlick, an the outskirts af Front Rayal, and the new largemauth bass hatchery at Stevensville, King and Queen Caunty.

The hatcheries are open ta the public and inspectian is invited. However, hatchery managers shauld be cantacted and appaintments made priar ta inspection trips. Correspandence shauld be addressed ta the fallawing: D. L. Shumate, manager, Marion Fish Hatchery, Marian; W. G. Seaman, manager, Mantebella Fish Nursery, Mantebella; W. C. Hawley, manager, Frant Rayal Fish Hatchery, Waterlick; C. P. Ramsey, manager, King and Queen Fish Hatchery, Stevensville.

Ques.: Is the Commission's game farm at Cumberland open to the public?

Ans.: Yes, the public is invited. Hawever, the farm manager shauld be cantacted and appaintments made prior ta inspection trips. Carrespandence shauld be addressed to Mr. Dennis Hart, manager, Cumberland Game Farm, Cumberland, Virginia.

Ques.: Is it true that unlike most herons, which nest in colonies, the green heron is a hermit and usually lives alone?

Ans.: Occasionally a few green herans place their nests tagether, but this apparently is accidental. There are na true raakeries af green herans and the birds lead a distinctly lanely life. Unlike ather members af the heran family, the green heran is nat gregariaus in its breeding habits.

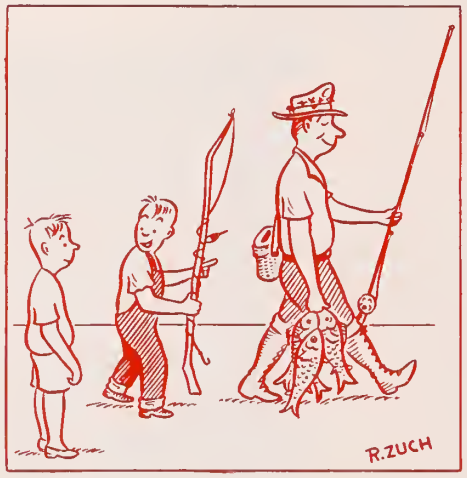
Ques.: How many litters does the gray squirrel produce each year?

Ans.: There are twa main breeding periads each year, although a few squirrels may praduce litters during practically every manth. The spring litter is barn in mid-February and leaves the nest abaut the first of April. The fall litter is barn August 1-15 and leaves the nest the latter part af September or the first af October.

Ques.: Are there any elk in Virginia today?

Ans.: During a faur-day apen season an elk in 1944 aver 60 elk were killed, but recent estimates of the size af the herd revealed twa small elk herds. One herd af 75-125 elk are in the Giles-Bland range, and abaut 35 elk are in the Batetourt Caunty range.

Ques.: How did the "bald" eagle get its name?



"He gave me a buck ta let him carry them thraugh tawn"

Ans.: The eagle has a fully feathered head with the head feathers being white. "Bald," in the days when the eagle was being named, retained its ald meaning of "white." It was in that sense that it was used as part af a gaad many animal names, such as the widgean ar baldpate.

Ques.: Does the eagle kill its prey with its beak? If not, how?

Ans.: The eagle never makes use af his beak in killing his prey. Larger birds are dispatched by the stroke af the eagle's dive; smaller anes are killed by the grip af its talans.

Ques.: What type of food can be used on an angleworm bed?

Ans.: Decampased leaves can be used along with carn meal, caffee graunds ar graund beef suet. Some of the warm raising experts recammend sugar in some cheap farm. Alsa, ardinary malasses can be spread an a burlap bag and applied ta the bed with the sticky side next ta the sail.

Ques.: What fish are commonly referred to as black bass?

Ans.: Smallmauth bass, largemauth bass, and spatted bass. All three species are faund in Virginia fresh waters.

Ques.: What chances for survival do tame deer have when returned to the wild?

Ans.: Their chances far survival are small. Hand-raised deer seldam became wild, and tame bucks are dangeraus during the mating seasan.

Ques.: Is it true that the black bear was at one time found throughout the state?

Ans.: Yes. Like the elk, the black bear once enjayed statewide distributian, but is naw canfined ta a fractian af its former range, occurring anly in the great Dismal Swamp and the mare rugged sectians of the mauntains.

Ques.: How many yaung does an opossum bear in one litter? How many young is the opossum able to get into its pouch at one time?

Ans.: The opassum takes a large family prize with as many as 12 ta 18 yaung in ane litter. They are sa tiny that the 12 ta 18 wauld hardly fill a teaspaan. The yaung are barn 12 ta 13 days after canceptian, in a very early stage af develapment. The 12 ta 18 yaung can be depasited camfartably in the pauch at ance. They are carried there far abaut eight weeks, until they have grawn ta the size af mice. Then they cling ta the mather's back as she travels abaut.

Ques.: Do bees, wasps, hornets, and yellow-jackets sting only once?

Ans.: The bee stings anly ance because it lases its stinger. Wasps, harnets, and yellawjackets are repeaters.

Ques.: Where can I obtain a copy of the book entitled *The Wild Turkey in Virginia: Its Status, Life History, and Management* by H. S. Mosby and C. O. Handley?

Ans.: This publicatian has been out af print far same time and ta aur knawledge na capies are available fram any saurce whatsaever.

Ques.: Are moles blind?

Ans.: A male can tell daylight fram darkness, but little more than that. Their eyes are no bigger than pinheads.

Ques.: Are muskrats known to travel any distance overland?

Ans.: Yes, muskrats make frequent excursians, even gaing considerable distance averland. If they find newly canstructed pands ta their liking, they immediately take up residence.

Ques.: Is the golden trout merely another name given to the rainbow?

Ans.: No, the galden traut is a separate species.

Dr. W. S. Newmon, president of Virginio Polytechnic Institute, in his welcoming oddress emphasized the importonce of public relations ond educotion in the wordens' everydoy work

WARDENS GO BACK TO SCHOOL

The Commission of Game and Inland Fisheries put its law enforcement staff through the paces this summer by an intensive one-week school at Virginia Polytechnic Institute.

Wardens and conservation officers heard authorities speak on law enforcement, game and fish conservation, and public relations.

Commission personnel, under the leadership of I. T. Quinn, executive director, were present to bring wardens up to date on the various Commission activities. B. W. Stras, Jr., Commission chairman, addressing the wardens, assured them that their fine work was being recognized and appreciated.

Commission photos by Kesteloo

(Left to right) A. R. Cochron, supervisor, Jefferson Notional Forest; I. T. Quinn, executive director, Commission, ond F. A. Connolly, U. S. F. S. information ond editoriol speciolist, got together during breok between scheduled octivities

Wordens got together from the three corners of Virginio. (Left to right) E. T. Rasnic, Lee County; E. L. Corter, Frederick County, ond J. A. Sounders, Princess Anne County

Mork D. Wilkins, F. B. I. agent, addressing the wordens on collecting ond preserving evidence, stressed the foct thot F. B. I. focilities were available to them at all times

A. H. Paessler, executive secretory, Virginio Woter Control Boord, discussed techniques of collecting water somples when checking pollution causes

MIGRATOI
GAME BIRD REGU
IN VIRGINIA
1952-53

RAILS AND GALLINULES

CLAPPER RAIL AND GALLINULES:

Season: September 1 - October 30.
Bag Limit: Fifteen a day in the aggregate of rails and gallinules, 15 in possession.
Hours: From one-half hour before sunrise until sunset each day.

SORA:

Season: September 1 - October 30.
Bag Limit: Twenty-five a day, 25 in possession.
Hours: From one-half hour before sunrise until sunset each day.

DOVES

Season: September 16 - September 30 and October 17 - October 31.
Bag Limit: Eight a day, 8 in possession.
Hours: From 12 o'clock noon until sunset each day.

WOODCOCK

Season: November 20 - December 19.
Bag Limit: Four a day, 8 in possession after first day.
Hours: One-half hour before sunrise to sunset each day.

WATERFOWL (DUCKS, GEESE, BRANT, COOTS)

Seasons: Ducks, Geese, Coot—November 17 - January 10.
Brant—November 17 - December 1.

Hours: From one-half hour before sunrise until one hour before sunset, except on the opening day shooting shall not begin until 12 o'clock noon, except at Back Bay no hunter shall be permitted to leave shore before one-half hour before sunrise and shall not be allowed to fire his gun before sunrise.

Bag Limits: Ducks, four a day, 8 in possession after first day, one of which may be a wood duck.
Geese, three Canada geese a day, 3 in possession.
Coot, ten a day, 10 in possession.
Brant, three a day, 3 in possession.